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EXAMINER	
PICH, PONNOREAY	

ART UNIT	PAPER NUMBER
2135	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/998,681	CHESTON ET AL.	
	Examiner	Art Unit	
	Ponnoreay Pich	2135	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 November 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-54* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-54* is/are rejected.

7)☒ Claim(s) *1,5,11,15,21 and 25* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11/30/2001*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-54 have been considered and are pending.

Information Disclosure Statement

The IDS submitted by the applicant has been considered by the examiner.

Specification

The abstract of the disclosure is objected to because the opening left parenthesis on lines 1 and 2 each do not have a corresponding closing right parenthesis. Correction is required. See MPEP § 608.01(b).

The disclosure is objected to because of the following informalities:

1. On page 14, line 8, "is YES" should be added to after the word "compare".
2. On page 15, line 15, "is YES" should be added to after the word "compare".

Appropriate correction is required.

Claim Objections

Claims 1, 5, 11, 15, 21, and 25 are objected to because of the following informalities:

1. As per claim 1: on line 13, there should be a space between ")" and "of".
2. As per claim 11: on line 20, there should be a space between ")" and "of".
3. As per claim 21: on line 15, there should be a space between ")" and "of".
4. As per claims 5, 15, and 25: on line 8 of each claims respectively, there should be the word "from" after the word "content".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

1. Claim 1 recites the limitation "said non-volatile memory" in lines 10-11. There is insufficient antecedent basis for this limitation in the claim.
2. Claim 11 recites the limitation "said non-volatile memory" in lines 16-17. There is insufficient antecedent basis for this limitation in the claim.
3. Claim 21 recites the limitation "said non-volatile memory" in lines 12-13. There is insufficient antecedent basis for this limitation in the claim.
4. Claim 24 recites the limitation "said public installation key" in lines 4-5. There is insufficient antecedent basis for this limitation in the claim.
5. Any claims not specifically addressed are rejected by virtue of dependency.

Appropriate correction is required.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3, 7-9, 21, 23, 27-29, 31, 34-36, and 39-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over http://web.archive.org/web/19990225080749/http://www.wwnet.net/~stevelim/booting.html (hereafter referred to as Stevelim) in view of Lovelace et al (US 6,263,431).

Claims 1 and 21:

Stevelim discloses a method for booting a computer system with first and second versions of a bootable program comprising the steps of and a computer program product for booting a computer system having first and second versions of a bootable program, said computer program product embodied in a machine readable medium, including programming for a processor, said computer program comprising a program of instructions for performing the steps of:

1. Loading said first and second versions of said bootable program into first and second partitions of a storage device coupled to said computer system (page 1, paragraph 1, lines 2-4 and paragraph 3).
2. Assigning said first partition as an active partition of said storage device by updating an active partition entry of a partition table of a master boot record (MBR) of said storage device, said active partition entry indicating which version of said BP is booted up on a power up of said computer system (page 1, bullets 2 and 3 and page 3, bullet 4).
3. Additional data defining said first and second versions of said bootable program (p3-5, contents of lilo.conf file).

4. Assigning the first version of a bootable program as an active entry (p3-5, contents of lilo.conf file and p3, bullet 4).
5. Assigning the second entry of a bootable program as an alternate entry (p3-5, contents of lilo.conf file).

Stevelim does not disclose:

1. Hashing a boot record (BR) of said first and second versions of said bootable program producing respective first and second digests.
2. Signing said first and second digests using a cryptographic signature engine and a private installation key producing first and second signatures.
3. **Storing said first and second signatures with** additional data defining said first and second versions of said bootable program **in first and second entries in said non-volatile memory coupled to said computer system**.
4. Assigning said first entry corresponding to said first version of said bootable program as an active entry in said non-volatile memory.
5. Assigning said second entry corresponding to said second version of said bootable program as an alternate entry in said non-volatile memory.

However, Lovelace discloses:

1. Hashing a boot record (BR) of a bootable program producing a digest (col 2, lines 50-60).
2. Signing said digest using a cryptographic signature engine and a private installation key producing a signature (col 3, lines 25-40 and 46-48 and col 5, lines 7-11).

3. Storing the signature with additional data defining the bootable program in an entry in a non-volatile memory coupled to said computer system (col 5, lines 26-35 and 50-57).
4. Assigning an entry corresponding to the bootable program as an entry in said non-volatile memory (col 3, line 62-col 4, line 13).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify boot managers (such as lilo) as disclosed by Stevelim according to the limitations recited in claims 1 and 21 in light of Lovelace's teachings. One of ordinary skill would have been motivated to do so as Lovelace's teachings provide the ability to verify the integrity of the boot components prior to the use of the boot components (col 1, lines 4-7). This would allow the multiple OS boot managers disclosed by Stevelim to check to make sure that a virus hasn't corrupted the boot components of any of the operating systems they were managing. Note that because Stevelim's boot manager handles multiple OS's, that when the boot record of each OS gets hashed and stored in memory, one of the things that must get hashed is the status of the OS—i.e. is the OS set active or as an alternate.

Claims 3 and 23:

Stevelim discloses said bootable program is an operating system of said computer system (page 1, paragraph 3).

Claims 7 and 27:

Stevelim and Lovelace do not explicitly disclose monitoring a third entry of said non-volatile memory for an indication said third entry is valid. However, Stevelim

discloses that there are known boot managers that can handle more than just one OS (p1, paragraph 3). Lovelace's teachings provide for a way to monitor boot components to make sure that they are not corrupted (col 1, lines 4-7). One of ordinary skill would be motivated on the indication that an entry/OS boot component is corrupted to monitor other OS's boot components to see if there are any chance one of the other OS's boot components aren't corrupted and one of the other OS's could be booted to from which repairs could be effected. It would have been obvious to one of ordinary skill in the art that if there existed a third entry/OS to also monitor the third entry of said non-volatile memory for an indication said third entry is valid. One of ordinary skill would be motivated to do so as it would help determine if the third OS could be used to effect repairs on damages that were possibly done by viruses.

Note that it would have been just as obvious for one of ordinary skill to have a boot manager which manages a maximum of just two OS's as opposed to the ones disclosed by Stevelim which can handle more than two. Should one of ordinary skill decide to make a boot manager handle only two OS's then it would be obvious that if there was a third entry in the non-volatile memory that was also valid, then it would be obvious that one of ordinary skill most likely want to replace one of the two previous OS with the third one. The choice of which one to replace is arbitrary, although one of ordinary skill would be most likely to replace the oldest one first—usually the first one. It would have been obvious to one of ordinary skill in the art to monitor a third entry of said non-volatile memory for an indication said third entry is valid as it would allow for a way to replace one of the previous two OS entries with the third entry.

Claims 8 and 28:

Stevelim and Lovelace do not explicitly disclose moving contents of said second entry to said first entry in response to said valid indication. However, it would have been obvious to one of ordinary skill to do so as it would allow for a way to replace one of the previous two OS entries with the third entry for boot managers that only handles two OS's. The choice of replacing the first entry as opposed to the second is arbitrary although the first one is usually the oldest and the oldest software is usually replaced first as known in the art at the time the applicant's invention was made.

Claims 9 and 29:

Stevelim and Lovelace do not explicitly disclose:

1. Moving the contents of said third entry to said second entry.
2. Marking said second partition corresponding to said second version of said bootable program as said active partition entry in said master boot record.
3. Booting said version of said bootable program in said active partition.

However, as discussed in claims 7 and 27, because Stevelim discloses boot managers capable of handling more than just one OS's, it would have been obvious to one of ordinary skill to have a boot manager which handles just two OS's. It is also common practice in the art to replace older software first. The steps recited in claims 9 and 29 are the steps that are necessary to replace the oldest/first OS in a system with a boot manager which handles only two OS's at a time with a third and make the second OS the new first OS, which will be necessary to properly replace the oldest OS the next time the oldest OS needs to be replaced in the boot manager. As the first OS has been

replaced by the second OS, it is obvious that the second OS/bootable program needs to be set as the active partition entry in the MBR or there would be no active partition set. One of ordinary skill would be motivated to further modify Stevelim and Lovelace's combination invention for the same reasons given in claims 8 and 28.

Claim 31:

Stevelim discloses a method for booting a computer system with first and second versions of a bootable program (BP) comprising the steps of:

1. Loading said first and second versions of said bootable program into first and second partitions of a storage device coupled to said computer system (p1, paragraphs 1 and 3).
2. Identifying said first version as an active partition in a master boot record (MBR) by placing data defining said first version in an active partition entry, said active entry indicating which version of said BP is booted on a power up of said computer system (p1, bullets 2 and 3 and p3, bullet 4).
3. Booting with the version in said active partition (p1, bullet 3).

Stevelim does not disclose:

1. Maintaining a version management table in a non-volatile memory wherein data placed in an active entry indicates which version of said BP corresponds to an active version and wherein data placed in an alternate entry indicates which version of said BP corresponds to an alternate version.

2. Comparing selected data in said active entry in said version management table to selected data pointed to by said active partition entry of said MBR returning a first compare result.
3. Booting with said version in said active partition **if said first compare result is true**.

However, a version management table of some sort must exist in the boot managers disclosed by Stevelim or there would be no way for the boot managers to keep track of which BP is the active version and which should be designated as alternates. The version management table would have to have data placed in an active entry to indicate which BP is the active one.

Further, Lovelace discloses:

1. Storing data defining the bootable program in an entry in a non-volatile memory (col 5, lines 26-35 and 50-57).
2. Comparing data in the non-volatile memory to data pointed to by partition entry of said MBR returning a compare result (col 5, lines 59-60).
3. Booting with the BP if compare result is true (col 5, lines 60-61).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made in light of the above disclosure to incorporate Lovelace's teachings with Stevelim according to the limitations recited in claim 31. One of ordinary skill would have been motivated to do so as it would allow for the boot managers disclosed by Stevelim to verify the integrity of the boot components of the BP before booting into the actual BP, thereby preventing possible infections by viruses. Note that

the version management table that existed in the boot managers disclosed by Stevelim must also exist in some form in the non-volatile memory once one of ordinary skill incorporate Lovelace's teachings with Stevelim to arrive at a multiple OS boot manager capable of detecting corrupted boot components. If it did not exist in the non-volatile memory, then the system would have no way of determining which boot component is corrupted for which OS.

Claim 34:

Stevelim does not explicitly disclose:

1. Replacing said data in said active entry with said data in said alternate entry if said first result is false.
2. Comparing selected data in said active entry in said version management table to selected data pointed to by said active partition entry of said MBR returning a second compare result.
3. Booting with said alternate version in said active partition if said second compare result is true.

However, Lovelace discloses:

1. Comparing data in the non-volatile memory to data pointed to by partition entry of said MBR returning a compare result (col 5, lines 59-60).
2. Booting with the BP if compare result is true (col 5, lines 60-61).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to further incorporate the limitations recited in claim 34 to Stevelim and Lovelace's combination method if said first result is false as this would

mean that the boot components of the first BP is corrupted. One of ordinary skill would obviously not boot to a BP whose boot components have been determined to be corrupted. One of ordinary skill would obviously compare the data in the version management table corresponding to the second BP with data pointed to by the second BP in the MBR to return a second compare result as one of ordinary skill would also want to verify if the second BP's boot components are also corrupted. If the second/alternate BP's boot component's are not corrupted as indicated by a true being returned as the result of the second compare, then it would be obvious for one of ordinary skill to boot the alternate BP to attempt repairs to the boot components of the first BP. The choice of when to set the alternate BP as the active entry is arbitrary. One of ordinary skill would be motivated to incorporate the limitations as recited in claim 34 into Stevelim and Lovelace's combination method because it would allow one of ordinary skill to find a way to repair the corrupted boot components as discussed above if the alternate BP's boot components aren't corrupted also.

Claim 35:

Stevelim and Lovelace do not explicitly disclose stopping booting of said computer system if said second compare result is false. However, it would have been obvious to one of ordinary skill to do so as if both the first and second compare result is false, then that means that the boot components of both the first and second BP are corrupted. One of ordinary skill in the art at the time the applicant's invention was made would be motivated to stop the boot process as this would prevent further corruption to the computer system.

Claim 36:

Stevelim discloses said active partition pointed to by said active partition entry in said MBR is changed in response to a version management program command sequence (p1, bullet 1).

Claim 39:

Claim 39 refers to determining when contents of a third entry of said non-volatile memory are valid. Claim 7 refers to monitoring a third entry of said non-volatile memory for an indication said third entry is valid. It is the examiner's opinion that these two limitations are substantially similar and the same reasons and motivations used to reject claim 7 also applies to claim 39.

Claim 40:

Claim 40 refers to moving contents of said alternate entry to said active entry when said contents of said third entry are valid. Claim 8 refers to moving contents of said second entry to said first entry in response to valid indication (by the third entry). The examiner notes that the first entry referred to in claim 8 is same as the active entry in claim 40 and the second entry in claim 8 is the same as the alternate entry in claim 40. As such, it is the examiner's opinion that the limitations recited in claims 8 and 40 are substantially similar and the same reasons and motivations used to reject claim 8 also applies to claim 40.

Claim 41:

Claim 41 refers to the steps of:

1. Moving contents of said third entry to said alternate entry.

2. Marking a second partition corresponding to said version of said bootable program as said active partition in said MBR.
3. Booting said version of said bootable program in said active partition.

Claim 9 refers to the steps of:

1. Moving contents of said third entry to said second entry.
2. Marking said second partition corresponding to said second version of said bootable program as said active partition entry in said master boot record.
3. Booting said version of said bootable program in said active partition.

It is the examiner's opinion that the limitations recited by these two claims are substantially similar and the same reasons and motivations used to reject claim 9 also applies to claim 41.

Claims 11, 13, 17-19, 43, 46-48, and 51-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over http://web.archive.org/web/19990225080749/http://www.wwnet.net/~stevelim/booting.html (hereafter referred to as Stevelim) in view of Lovelace et al (US 6,263,431) and further in view of Rickey et al (US 2002/0166059).

Claim 11:

Claim 11 is similar to claims 1. The difference is that claim 11 refers to CPU circuitry which performs the steps of the method recited in claim 1. Claim 11 also recites the components of the computer system needed to implement the method of

claim 1. The same reasoning used to reject claim 1 applies to claim 11 for the limitations they have in common. The limitation exclusive to claim 11 will now be addressed.

Stevelim does not explicitly disclose a computer system comprising:

1. A central processing unit (CPU).
2. A random access memory (RAM).
3. An electronically erasable programmable read only memory (EEPROM).
4. An I/O adapter.
5. A disk storage system coupled to said I/O adapter.
6. A bus system coupling said CPU to said EEPROM, said I/O adapter, and said RAM.

However, a computer system comprising a CPU, RAM, I/O adapter, disk storage system coupled to said I/O adapter, and a bus system coupling said CPU to said I/O adapter, and said RAM is typical state of the art of computer systems at the time the applicant's invention was made. Further, Lovelace discloses a computer with a disk storage system, processor, and I/O device coupled together (Fig 1 and col 2, lines 44-46) being used in his secure boot system. Lovelace also discloses the use of non-volatile memory (Fig 1, item 100) in the secure boot system. The non-volatile memory disclosed by Lovelace is flash memory and not EEPROM, but it is known to one of ordinary skill that flash memory technology is based off of EEPROM. Further, Rickey discloses that EEPROM can be used for the non-volatile memory in a secure boot system (p3, paragraph 0037).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to use EEPROM instead of flash memory as the non-volatile memory in the secure boot system disclosed by Lovelace for cost saving purposes as EEPROM is older technology and older technology is usually cheaper than newer technology. In light of the teachings of Lovelace and Rickey, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to utilize the method recited in claim 1 in the typical computer system according to the limitations recited in claim 11. One of ordinary skill would have done so as Lovelace and Rickey both showed that a computer system with such components are needed to implement a system which allows for the detection of corrupted boot components. Incorporating Lovelace and Rickey's teachings into Stevelim's teachings would allow for a multiple OS boot manager capable of detecting corrupted boot components. Note that because Stevelim's boot manager handles multiple OS's, that when the boot record of each OS gets hashed and stored in memory, one of the things that must get hashed is the status of the OS—i.e. is the OS set active or as an alternate.

Claim 13:

Stevelim discloses said bootable program is an operating system of said computer system (page 1, paragraph 3).

Claim 17:

Claim 17 refers to a computer system comprising circuitry for performing the steps of the methods of claim 7 and as such is rejected for the same reasons and motivations discussed in claim 7.

Claim 18:

Claim 18 refers to a computer system comprising circuitry for performing the steps of the methods of claim 8 and as such is rejected for the same reasons and motivations discussed in claim 8.

Claim 19:

Claim 19 refers to a computer system comprising circuitry for performing the steps of the methods of claim 9 and as such is rejected for the same reasons and motivations discussed in claim 9.

Claim 43:

Claim 43 is similar to claim 31 except claim 43 refers to CPU circuitry for performing the steps of the method of claim 31. Claim 43 also recites the components of the computer system needed to implement the method of claim 31. The same reasoning used to reject claim 31 applies to claim 43 for the limitations they have in common. The limitation exclusive to claim 43 will now be addressed.

Stevelim does not explicitly disclose a computer system comprising:

1. A central processing unit (CPU).
2. A random access memory (RAM).
3. An electronically erasable programmable read only memory (EEPROM).
4. An I/O adapter.
5. A disk storage system coupled to said I/O adapter.
6. A bus system coupling said CPU to said EEPROM, said I/O adapter, and said RAM.

However, a computer system comprising a CPU, RAM, I/O adapter, disk storage system coupled to said I/O adapter, and a bus system coupling said CPU to said I/O adapter, and said RAM is typical state of the art of computer systems at the time the applicant's invention was made. Further, Lovelace discloses a computer with a disk storage system, processor, and I/O device coupled together (Fig 1 and col 2, lines 44-46) being used in his secure boot system. Lovelace also discloses the use of non-volatile memory (Fig 1, item 100) in the secure boot system. The non-volatile memory disclosed by Lovelace is flash memory and not EEPROM, but it is known to one of ordinary skill that flash memory technology is based off of EEPROM. Further, Rickey discloses that EEPROM can be used for the non-volatile memory in a secure boot system (p3, paragraph 0037).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to use EEPROM instead of flash memory as the non-volatile memory in the secure boot system disclosed by Lovelace for cost saving purposes as EEPROM is older technology and older technology is usually cheaper than newer technology. In light of the teachings of Lovelace and Rickey, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to utilize the method recited in claim 31 in the typical computer system according to the limitations recited in claim 43. One of ordinary skill would have done so as Lovelace and Rickey both showed that a computer system with such components are needed to implement a system which allows for the detection of corrupted boot components.

Incorporating Lovelace and Rickey's teachings into Stevelim's teachings would allow for a multiple OS boot manager capable of detecting corrupted boot components.

Claim 46:

Claim 46 refers to a computer system comprising circuitry for implementing the method recited by claim 34. As such, the same reasoning and motivation used to reject claim 34 also applies to claim 46.

Claim 47:

Claim 47 refers to a computer system comprising circuitry for implementing the method recited by claim 35. As such, the same reasoning and motivation used to reject claim 34 also applies to claim 47.

Claim 48:

Claim 48 refers to a computer system which implements the method of claim 36 and is rejected using the same arguments used for claim 36.

Claim 51:

Claim 51 refers to a computer system comprising circuitry for implementing the method recited in claim 39. As such, the same reasoning and motivation used to reject claim 39 also applies to claim 51.

Claim 52:

Claim 52 refers to a computer system comprising circuitry for implementing the method recited in claim 40. As such, the same reasoning and motivation used to reject claim 40 also applies to claim 52.

Claim 53:

Claim 53 refers to a computer system comprising circuitry for implementing the method recited in claim 41. As such, the same reasoning and motivation used to reject claim 41 also applies to claim 53.

Claims 2, 10, 22, 30, 32-33, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over http://web.archive.org/web/19990225080749/http://www.wwnet.net/~stevelim/booting.html (hereafter referred to as Stevelim) in view of Lovelace et al (US 6,263,431) and further in view of applicant's admittance of prior art.

Claims 2 and 22:

Stevelim and Lovelace do not disclose locking said first and second entries in said non-volatile memory with a hardware locking mechanism of said computer system modification of said contents of said first and second entries. However, the applicant admitted in the specification that hardware locking mechanisms were well known in the art at the time the applicant's invention was made and is typically located in the controller managing access to the non-volatile memory (p7, lines 14-23).

It would have been obvious to one of ordinary skill to further modify Stevelim and Lovelace's combination method and system according to the limitation recited in claims 2 and 22 as it would prevent changing the contents of said first and second entries either by accident or by a virus after POST is finished and an OS is loaded.

Claims 10 and 30:

Claims 10 and 30 recite a similar limitation as recited in claims 2 and 22. As such the same reasons and motivations used to reject claims 2 and 22 also apply to claims 10 and 30.

Claim 32:

Stevelim and Lovelace do not disclose said active and alternate entries in said version management table are locked with a hardware read only locking mechanism at selected times. However, the applicant admitted in the specification that hardware locking mechanisms were well known in the art at the time the applicant's invention was made and is typically located in the controller managing access to the non-volatile memory (p7, lines 14-23).

It would have been obvious to one of ordinary skill in the art to further modify Stevelim and Lovelace's combination method according to the limitation recited in claim 32 as it would prevent the active and alternate entries in the version management table from being changed accidentally or by a virus when the system has no reason to write to them.

Claim 33:

Stevelim discloses said bootable program is an operating system of said computer system (p1, paragraph 3).

Claim 42:

Stevelim and Lovelace do not disclose locking said active and alternate entries in said non-volatile memory to prevent a modification of contents of said active and alternate entries. However, the applicant admitted in the specification that hardware

locking mechanisms were well known in the art at the time the applicant's invention was made and is typically located in the controller managing access to the non-volatile memory (p7, lines 14-23).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to further modify the combination method of Stevelim and Lovelace according to the limitation recited in claim 42. One of ordinary skill would have been motivated to do so as it would prevent accidental modification or modification by a virus of the memory content.

Claims 12, 20, 44-45, and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over http://web.archive.org/web/19990225080749/http://www.wwnet.net/~stevelim/booting.html (hereafter referred to as Stevelim) in view of Lovelace et al (US 6,263,431) and Rickey et al (US 2002/0166059) and further in view of applicant's admittance of prior art.

Claim 12:

Stevelim and Lovelace do not disclose locking said first and second entries in said non-volatile memory with a hardware locking mechanism of said computer system modification of said contents of said first and second entries. However, the applicant admitted in the specification that hardware locking mechanisms were well known in the

art at the time the applicant's invention was made and is typically located in the controller managing access to the non-volatile memory (p7, lines 14-23).

It would have been obvious for one of ordinary skill to further modify Stevelim, Lovelace, and Rickey's combination computer system according to the limitation recited in claims 12 as it would prevent changing the contents of said first and second entries either by accident or by a virus after POST is finished and an OS is loaded.

Claim 20:

Claim 20 recites a similar limitation as claim 12. As such, the same reasons and motivations used to reject claim 12 also apply to claim 20.

Claim 44:

Claim 44 recites a similar limitation to as claim 32. As such, the same reasons and motivations used to reject claim 32 also apply to claim 44.

Claim 45:

Stevelim discloses said bootable program is an operating system of said computer system (p1, paragraph 3).

Claim 54:

Stevelim, Lovelace, and Rickey do not disclose a computer system further comprising circuitry for locking said active and alternate entries in said non-volatile memory to prevent a modification of contents of said active and alternate entries. However, the applicant admitted in the specification that hardware locking mechanisms were well known in the art at the time the applicant's invention was made and is

typically located in the controller managing access to the non-volatile memory (p7, lines 14-23).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to further modify the combination method of Stevelim , Lovelace, and Rickey according to the limitation recited in claim 54. One of ordinary skill would have been motivated to do so as it would prevent modification of the memory content when the active and alternate entries do not need to be changed such as by a virus.

Claims 4-6, 24-16, and 37-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over http://web.archive.org/web/19990225080749/http://www.wwnet.net/~stevelim/booting.html (hereafter referred to as Stevelim) in view of Lovelace et al (US 6,263,431) and further in view of Schieve et al (US 5,463,766).

Claim 4:

Stevelim does not disclose:

1. Loading a BR from said active partition entry of said MBR using Power-On-Self-Test (POST) code when said computer system is powered up.
2. Decrypting said first signature in said active entry using a public installation key.
3. Comparing a hash of said BR of said active partition to a hash of a BR retrieved from said active entry, returning a first compare result.

4. Booting with said first version of said bootable program in said active partition when said first compare result is true.
5. Retrieving said second signature from said alternate entry when said first compare result is false.

However, Schieve discloses that POST is a prior art diagnostics process which is a series of tests that the computer performs on some of the core components each time a computer is turned on (col2, lines 24-33). Further, Lovelace discloses:

1. Decrypting a signature in memory using a public installation key (col 5, lines 7-11).
2. Comparing the hash of a BR of a partition to a hash retrieved from memory, returning a first compare result (col 5, lines 59-60).
3. Booting with the bootable program referred to in a partition when the said compare result is true (col 5, lines 61-62).

It would be obvious to one of ordinary skill in the art at the time the applicant's invention was made in light of Lovelace and Schieve's teachings to further modify the combination method of Stevelim and Lovelace according to the limitations recited in claims 4. One of ordinary skill would be motivated to load a BR from said active partition entry of said MBR using a POST code when said computer system is powered up because it would allow for the test of whether the boot components were corrupted to be performed automatically each time the computer is booted prior to loading the operating system. One of ordinary skill would be motivated to further incorporate the teachings disclosed by Lovelace according to the limitations recited in claim 4 as it

would allow for the testing of corrupted boot components in the multiple OS boot managers disclosed by Stevelim. One of ordinary skill would recognize that if the first OS located in the active partition is not corrupted—i.e. the hashes match, that it would be safe to boot that OS. It would also be obvious for one of ordinary skill would also retrieve the second signature from the second alternate entry when the first compare result is false because if a virus had corrupted the first active partition, one of ordinary skill would want to make sure that the alternate partition and alternate OS is not corrupted. If they were not, one of ordinary skill would recognize that he/she could boot into the alternate OS/partition to possibly effect repairs on the first OS/partition.

Claim 24:

Stevelim does not disclose:

1. Loading a BR from said active partition entry with Power-On-Self-Test (POST) code when said computer system is powered up.
2. Decrypting said first signature in said active entry using a public installation key.
3. Comparing a hash of said BR of said active partition to a hash of a BR retrieved from said active entry, returning a first compare result.
4. Booting with said first version of said bootable program in said active partition when said first compare result is true.
5. Retrieving said second signature from said alternate entry when said first compare result is false.

However, Schieve discloses that POST is a prior art diagnostics process which is a series of tests that the computer performs on some of the core components each time a computer is turned on (col2, lines 24-33). Further, Lovelace discloses:

1. Decrypting a signature in memory using a public installation key (col 5, lines 7-11).
2. Comparing the hash of a BR of a partition to a hash retrieved from memory, returning a compare result (col 5, lines 59-60).
3. Booting with the bootable program referred to in a partition when the said compare result is true (col 5, lines 61-62).

It would be obvious to one of ordinary skill in the art at the time the applicant's invention was made in light of Lovelace and Schieve's teachings to further modify the combination method of Stevelim and Lovelace according to the limitations recited in claims 4. One of ordinary skill would be motivated to load a BR from said active partition with POST code when said computer system is powered up because it would allow for the test of whether the boot components were corrupted to be performed automatically each time the computer is booted prior to loading the operating system. One of ordinary skill would be motivated to further incorporate the teachings disclosed by Lovelace according to the limitations recited in claim 4 as it would allow for the testing of corrupted boot components in the multiple OS boot managers disclosed by Stevelim. One of ordinary skill would recognize that if the first OS located in the active partition is not corrupted—i.e. the hashes match, that it would be safe to boot that OS. It would also be obvious for one of ordinary skill would also retrieve the second

signature from the second alternate entry when the first compare result is false because if a virus had corrupted the first active partition, one of ordinary skill would want to make sure that the alternate partition and alternate OS is not corrupted. If they were not, one of ordinary skill would recognize that he/she could boot into the alternate OS/partition to possibly effect repairs on the first OS/partition.

Claims 5 and 25:

Stevelim does not disclose:

1. Decrypting said signature in said alternate entry using said public installation key.
2. Comparing said hash of said BR of said active partition to a hash of a BR retrieved from said alternate entry, returning a second compare result.
3. Clearing said active entry from said non-volatile memory when said second compare result is true.
4. Moving contents from said alternative entry to said active entry.
5. Booting with said alternate version identified by said active entry.

However, Lovelace discloses:

1. Decrypting a signature in memory using a public installation key (col 5, lines 7-11).
2. Comparing the hash of a BR of a partition to a hash retrieved from memory, returning a compare result (col 5, lines 59-60).
3. Booting with the bootable program referred to in a partition when the said compare result is true (col 5, lines 61-62).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to further modify Stevelim, Lovelace, and Schieve's combination invention according to the limitations recited in claims 5 and 25. It would have been obvious because one of ordinary skill would recognize that should a first entry hash be corrupted, then there could be the possibility that the system was infected with a virus. One of ordinary skill would naturally decrypt the alternate entry's signature and check the hash to see of it was corrupted. If they were not corrupted, then one of ordinary skill would recognize that he/she could boot into the alternate OS/entry and possibly effect repairs against any damages done to the first OS/entry. To do this, the alternate entry would have to be made the new active entry to boot to the alternate OS. One of ordinary skill would be motivated to modify the combination invention according to the limitations recited in claims 5 and 25 as it would allow for a way to boot into a different OS for repairing any damages done by a virus.

Claims 6 and 26:

Stevelim and Lovelace do not disclose halting said POST when said second compare result is false. However, Schieve discloses that the last step performed by POST is to load the OS (col 2, lines 37-38). It would have been obvious to one of ordinary skill in the art in light of Schieve's teachings to halt POST when the second compare result is false. It would be obvious because if the second compare result is false also, then it means that the alternate OS boot components are also corrupted (possibly by a virus). As such, one would risk further infecting the OS if one were to continue the POST process and load the OS. One of ordinary skill would be motivated

to halt said POST when said second compare result is false as it would help prevent the first and second OS and the data accessed by said OS's from being infected with a virus.

Claims 37 and 38:

Stevelim and Lovelace do not disclose said compare step is performed by Power-On-Self-Test (POST) code. However, Schieve discloses that POST is a prior art diagnostics process which is a series of tests that the computer performs on some of the core components each time a computer is turned on (col2, lines 24-33). It would have been obvious to one of ordinary skill in the art to have the compare step be performed by POST code in light of Schieve's teachings. One of ordinary skill would have been motivated to do so as it would allow for the boot components to be tested automatically each time a computer is booted before the OS starts.

Claims 14-16 and 49-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over http://web.archive.org/web/19990225080749/http://www.wwnet.net/~stevelim/booting.html (hereafter referred to as Stevelim) in view of Lovelace et al (US 6,263,431) and Rickey et al (US 2002/0166059) further in view of Schieve et al (US 5,463,766).

Claim 14:

Claim 14 refers to a computer system comprising circuitry for performing the steps of the method recited in claim 4. As such, it is rejected for the same reasons and motivation discussed in claim 4.

Claim 15:

Claim 15 recites a computer system comprising circuitry for performing the steps of the method of claim 5 and as such it is rejected for the same reasons and motivation discussed in claim 5.

Claim 16:

Claim 16 recites a computer system comprising circuitry for performing the steps of the method of claim 6 and as such it is rejected for the same reasons and motivation discussed in claim 6.

Claims 49 and 50:

Claims 49 and 50 refer to a computer system which implements the method recited in claims 37 and 38. As such the same reasons and motivations used to reject claims 37 and 38 also applies to claims 49 and 50.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

1. http://didyouknow.imation.com/information-art9.html (last visited on 3/25/2005) discloses flash memory is based off of EEPROM technology.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ponnoreay Pich whose telephone number is 571-272-7962. The examiner can normally be reached on 8:00am-4:30pm Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim Vu can be reached on 571-272-3859. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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